

Atty Dkt. No.:10990641-1
USSN: 09/359,527

AMENDMENTS

Please incorporate the amendments below into the above-referenced application:

In the Claims:

1. (Cancelled)
2. (Currently Amended) A method according to claim 10, additionally comprising operating the deposition apparatus according to the ~~actual~~ **corrected** drive pattern.
3. (Previously Presented) A method according to claim 10 wherein the probes are DNA or RNA probes.
4. (Previously Presented) A method according to claim 10 additionally comprising saving the target drive pattern in a memory of the deposition apparatus.
5. (Currently Amended) A method according to claim 10 additionally comprising saving the target drive pattern in a memory of the deposition apparatus, and wherein the ~~actual~~ **corrected** drive pattern is saved in the memory.
6. (Cancelled)
7. (Cancelled)
8. (Currently Amended) A method of fabricating an addressable array of biopolymer probes on a substrate according to a target array pattern using a deposition apparatus which, when operated according to a target drive pattern based on nominal operating parameters of the apparatus **and determined by a processor in communication with the deposition apparatus,** provides the probes on the substrate *in* the target array pattern, the method comprising:

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(a) examining at least one operating parameter for an error from a nominal value which error will result in use of the target drive pattern producing a discrepancy between the target array pattern and an actual array pattern deposited;

(b) when an error is detected deriving, based on the error, ~~an actual~~ corrected drive pattern different from the target drive pattern such that use of the ~~actual~~ corrected drive pattern results in a reduced discrepancy between the target and actual array patterns; and

(c) operating the deposition apparatus according to the ~~actual~~ corrected drive pattern so as to fabricate the array;

wherein:

the deposition apparatus includes a dispensing head to dispense fluid droplets containing the probes or probe precursors, and a transport system to move at least one of the dispensing head and substrate relative to the other as the droplets are dispensed from the head, so as to form the array;

the ~~target~~ drive pattern controls operation of the transport system; and

the operating parameter is the position of the dispensing head, which is examined by viewing the dispensing head.

9. (Previously Presented) A method according to claim 8 wherein the operating parameter is examined by viewing a fiducial mark on the dispensing head.

10. (Currently Amended) A method of fabricating an addressable array of biopolymer probes on a substrate according to a target array pattern using a deposition apparatus which, when operated according to a target drive pattern based on nominal operating parameters of the apparatus and determined by a processor in communication with the deposition apparatus, provides the probes on the substrate in the target array pattern, the method comprising:

(a) examining at least one operating parameter for an error from a nominal value which error will result in use of the target drive pattern producing a discrepancy between the target array pattern and an actual array pattern deposited;

(b) when an error is detected deriving, based on the error, ~~an actual~~ corrected drive pattern different from the target drive pattern such that use of the ~~actual~~ corrected

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drive pattern results in a reduced discrepancy between the target and actual array patterns;
and

(c) operating the deposition apparatus according to the **actual corrected** drive pattern so as to fabricate the array;

wherein:

the deposition apparatus includes a dispensing head with multiple nozzles to dispense fluid droplets containing the probes or probe precursors, and a transport system to move at least one of the dispensing head and substrate relative to the other as the droplets are dispensed from the head, so as to form the array;

the drive pattern controls operation of the transport system;

the at least one operating parameter is the position of the substrate or dispensing head, or orientation of a nozzle, and is examined by viewing the dispensing head, or nozzle, or a droplet pattern previously dispensed from the head.

11. (Currently Amended) A method according to claim 4 additionally comprising saving the target drive pattern in a memory of **a processor in communication with** the deposition apparatus, and wherein the **actual corrected** drive pattern is saved in the memory, prior to operating the dispensing head and transport system to form the array.

12. (Currently Amended) A method according to claim 4 additionally comprising saving the target drive pattern in a memory of **a processor in communication with** the deposition apparatus, and wherein the **actual corrected** drive pattern is derived by modifying, based on the detected error, instructions to at least one deposition apparatus component based on the target drive pattern during operation of the dispensing head and transport system to form the array.

13. (Previously Presented) A method according to claim 10 wherein the at least one operating parameter is examined by viewing the droplet pattern previously dispensed from the head.

14. (Previously Presented) A method according to claim 10 wherein the at least one operating parameter is a position of the dispensing head.

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Claims 15-16 (Cancelled).

17. (Currently Amended) A method of fabricating an addressable array of biopolymer probes on a substrate according to a target array pattern using a deposition apparatus which, when operated according to a target drive pattern based on nominal operating parameters of the apparatus and determined by a processor in communication with the deposition apparatus, provides the probes on the substrate in the target array pattern, the method comprising:

(a) examining at least one operating parameter for an error from a nominal value which error will result in use of the target drive pattern producing a discrepancy between the target array pattern and an actual array pattern deposited;

(b) when an error is detected deriving, based on the error, an-actual corrected drive pattern different from the target drive pattern such that use of the actual corrected drive pattern results in a reduced discrepancy between the target and actual array patterns; and

(c) operating the deposition apparatus according to the actual corrected drive pattern so as to fabricate the array;

wherein:

the deposition apparatus includes a dispensing head with multiple nozzles to dispense fluid droplets containing the probes or probe precursors, and a transport system to move at least one of the dispensing head and substrate relative to the other as the droplets are dispensed from the head, so as to form the array;

the drive pattern controls operation of the transport system;

and wherein the at least one parameter is a position of a nozzle which is examined by viewing the nozzle, or a droplet pattern previously dispensed from the head.

Claims 18-48 (Cancelled).

49. (Currently Amended) A method of fabricating an addressable array of biopolymer probes on a substrate according to a target array pattern using a deposition apparatus which, when operated according to a target drive pattern based on nominal operating parameters of the apparatus and determined by a processor in

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communication with the deposition apparatus, provides the probes on the substrate in the target array pattern, the method comprising:

(a) examining at least one operating parameter for an error from a nominal value which error will result in use of the target drive pattern producing a discrepancy between the target array pattern and an actual array pattern deposited;

(b) when an error is detected deriving, based on the error, ~~an actual~~ **corrected** drive pattern different from the target drive pattern such that use of the **actual corrected** drive pattern results in a reduced discrepancy between the target and actual array patterns; and

(c) operating the deposition apparatus according to the **actual corrected** drive pattern so as to fabricate the array;

wherein the operating parameter is a fluid volume dispensed by the deposition apparatus.

50. (Currently Amended) A method of fabricating an addressable array of biopolymer probes on a substrate according to a target array pattern using a deposition apparatus which, when operated according to a target drive pattern based on nominal operating parameters of the apparatus **and determined by a processor in communication with the deposition apparatus**, provides the probes on the substrate in the target array pattern, the method comprising:

(a) examining at least one operating parameter for an error from a nominal value which error will result in use of the target drive pattern producing a discrepancy between the target array pattern and an actual array pattern deposited;

(b) when an error is detected deriving, based on the error, ~~an actual~~ **corrected** drive pattern different from the target drive pattern such that use of the **actual corrected** drive pattern results in a reduced discrepancy between the target and actual array patterns; and

(c) operating the deposition apparatus according to the **actual corrected** drive pattern so as to fabricate the array;

wherein the operating parameter is a position of a component which varies due to thermal expansion.

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51. (Currently Amended) A method of fabricating an addressable array of biopolymer probes on a substrate according to a target array pattern using a deposition apparatus which, when operated according to a target drive pattern based on nominal operating parameters of the apparatus and determined by a processor in communication with the deposition apparatus, provides the probes on the substrate in the target array pattern, the method comprising:

(a) examining at least one operating parameter for an error from a nominal value which error will result in use of the target drive pattern producing a discrepancy between the target array pattern and an actual array pattern deposited;

(b) when an error is detected deriving, based on the error, an actual corrected drive pattern different from the target drive pattern such that use of the actual corrected drive pattern results in a reduced discrepancy between the target and actual array patterns; and

(c) operating the deposition apparatus according to the actual corrected drive pattern so as to fabricate the array;

wherein:

the deposition apparatus includes a dispensing head to dispense fluid droplets containing the probes or probe precursors, and a transport system to move at least one of the dispensing head and substrate relative to the other as the droplets are dispensed from the head, so as to form the array;

the apparatus further includes an encoder to provide data on the location of the substrate or head; and

the at least one operating parameter is an encoder error.

52. (Currently Amended) A method of fabricating an addressable array of biopolymer probes on a substrate according to a target array pattern using a deposition apparatus which, when operated according to a target drive pattern based on nominal operating parameters of the apparatus and determined by a processor in communication with the deposition apparatus, provides the probes on the substrate in the target array pattern, the method comprising:

(a) examining at least one operating parameter for an error from a nominal value which error will result in use of the target drive pattern producing a discrepancy between the target array pattern and an actual array pattern deposited;

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(b) when an error is detected deriving, based on the error, ~~an actual~~ corrected drive pattern different from the target drive pattern such that use of the ~~actual~~ corrected drive pattern results in a reduced discrepancy between the target and actual array patterns; and

(c) operating the deposition apparatus according to the ~~actual~~ corrected drive pattern so as to fabricate the array;

wherein:

the deposition apparatus includes a dispensing head with multiple nozzles to dispense fluid droplets containing the probes or probe precursors, and a transport system to move at least one of the dispensing head and substrate relative to the other as the droplets are dispensed from the head, so as to form the array;

the drive pattern controls operation of the transport system;

the operating parameter is the position of the dispensing head, or orientation of a nozzle, and is examined by viewing the dispensing head, or nozzle.

Claims 53-54 (Cancelled).

55. (Currently Amended) A method according to claim 49 wherein the deposition apparatus comprises multiple jets for dispensing droplets, and wherein the ~~actual~~ corrected pattern is provided by a processor in communication with the deposition apparatus which provides an instruction to switch to a different jet when a deviation from nominal volume is encountered for one jet which is more than a predetermined tolerance.

56. (Currently Amended) A method of fabricating an addressable array of biopolymer probes on a substrate according to a target array pattern using a deposition apparatus which, when operated according to a target drive pattern based on nominal operating parameters of the apparatus and determined by a processor in communication with the deposition apparatus, provides the probes on the substrate in the target array pattern, the method comprising:

(a) examining at least one operating parameter for an error from a nominal value which error will result in use of the target drive pattern producing a discrepancy between the target array pattern and an actual array pattern deposited;

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(b) when an error is detected deriving, based on the error, an-actual corrected drive pattern different from the target drive pattern such that use of the actual corrected drive pattern results in a reduced discrepancy between the target and actual array patterns; and

(c) operating the deposition apparatus according to the actual corrected drive pattern so as to fabricate the array;

wherein the same error affects less than all of the array features.

57. (Previously Presented) A method according to claim 10 wherein the same error affects less than all of the array features.